STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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North Carolina Board of Transportation
Environmental Planning and Policy Committee
Meeting Minutes for September 1, 2004

A meeting of the Environmental Planning and Policy Committee (EPPC) was held September 1, 2004 at 8:30 AM in the Board Room (Room 150) of the Transportation Building. Board Member Nina Szlosberg chaired the meeting. Other Board of Transportation members that attended were:

Conrad Burrell	Doug Galyon
Tom Betts	Larry Helms
Mac Campbell	Cameron McRae
Bob Collier	Andrew Perkins, Jr.
Marion Cowell	Lanny Wilson
Nancy Dunn	

Other attendees included:

Gray Baldwin	Julie Hankins	Roger Rochelle
Nicole Burris	Emily Lawton	John Sullivan
Greg Dean	Sharon Lipscomb	Joel Setzer
Lisa Glover	Karim Manji	Bruce Thompson
Rob Hanson	Ehren Meister	Greg Thorpe
Teresa Hart	Mike Mills	Don Voelker
M. L. Holder	Jon Nance	Marcus Wilner
David Hyder	M. A. Pettyjohn	

Ms. Szlosberg called the meeting to order at 8:30 AM and accepted a motion to approve the meeting minutes from the August committee meeting as presented. The minutes were approved.

Ms. Szlosberg opened by reminding the Board of the importance of air quality and the various initiatives that are ongoing in this area within different units of NCDOT. One of these areas is the Equipment and Inventory Control Unit who has initiatives in the Alternative Fuel Vehicle (AFV) arena. With that, Ms. Szlosberg turned the podium over to Mr. Drew Harbinson, Director of the Equipment and Inventory Control Unit, to discuss the related Fleet Environmental Programs.

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“History of BioDiesel Use”:

Mr. Harbinson started his presentation by stating that the Fleet Unit has been working on reducing environmental impact for a number of years. This is evident by the increase in the use of biodiesel as an alternative fuel choice. The use of biodiesel is up to 2.5 million gallons in 2004 (up from 65,000 gallons in 2000). He stated that the fleet consists of approximately 24,000 pieces of equipment ranging from generators to large cranes. According to Mr. Harbinson, biodiesel was chosen as the alternative fuel of choice due to it’s relatively low infrastructure modification cost with immediate benefits. The immediate positive impact is the reduction in the particulates (heavy metals) by as much as 20%. The downside is a slight increase (1-3%, depending on which study you go by) in nitrous oxide (NOX) emissions. According to Mr. Harbinson, by year 2007, there will be a quantum leap in how diesel engines operate due to new mandates by the Environmental Protection Agency (EPA). By 2010, these requirements will be even more stringent than 2007 due to the mandate to use Exhaust Gas Recycling / Recirculation (EGR) technology.

“State Fuel Sites”:

Mr. Harbinson discussed the all the fuel sites that are currently in use within the State. There are over 122 fuel sites in use throughout NCDOT. Of these, Divisions 5, 10, and 12 are the heaviest users of biodiesel. Mr. Harbinson stated that Fleet Management had looked at Compressed Natural Gas (CNG) as an alternative fuel; however, the cost factor to convert the fuel sites ($200,000 to $300,000 per site) prohibited such a decision.

“Vehicles Using Biodiesel”:

Mr. Harbinson stated that all the samples of equipment shown are capable of burning biodiesel with very little to no modifications. The conversion process is as simple as changing out the filter assembly in the engine of the equipment along with a filter replacement at the fuel dispensing pump.

“Future of AFV Pickup < 8500 GVW”:
Mr. Harbinson stated that ethanol blend fuel introduced by GM (E-85) is becoming increasingly common. The ethanol blend of gasoline is usually produced from corn stock. This type of vehicle reduces the particulates and is recognized by the Environmental Protection Agency (EPA) for an AFV. On the other hand, the hybrid vehicle (runs on gasoline and an electric motor) has not been recognized by the EPA as an AFV. There is, however, increasing pressure by the Clean Cities Coalition to get EPA to recognize these vehicles as AFV’s. If NCDOT were to use the hybrid vehicles, we still cannot claim them as AFV’s because of lack of EPA approval at this point.

Mr. Harbinson stated that the fleet does consist of approximately 200 units that are bi-fuel or propane fueled. The problem is that Ford is discontinuing this vehicle. Divisions 1, 7, and 10 have some of these vehicles. He concluded by stating that the Fleet Unit is E-85 and the E-10 are being evaluated as the AFV of choice in NCDOT on the gasoline side and that the hybrid is also being evaluated. If the evaluation on the hybrid is conducted now, NCDOT will be prepared once EPA approves it as an AFV. Mr. Harbinson also stated that he and Mr. Bruce Thompson have attended a hybrid vehicle convention in Florida and they were impressed with the performance of hybrid vehicles. The Fleet Unit is looking at buying two units over the next two years. Any future purchases will be considered for use in the yard maintenance activities. He also stated that the previous versions of the hybrid that the Fleet Unit owned have been sold to a local high school for use in their AFV Automotive

Curriculum. This was a win-win for both parties. These previous versions were not as efficient as the newer generation.

Ms. Szlosberg inquired as to what the "E" stands for in the E-85 GM full sized pick-up. Mr. Harbinson stated that it stood for Ethanol. In addition, she asked if the Hybrid Vehicle is recognized by the EPA as an AFV? Mr. Thompson stated that it is not at this time. During the same slide presentation, she also asked what is the negative impact of EPA not recognizing the Hybrid as an AFV? Mr. Harbinson stated that it would not help NCDOT Fleet Unit in meeting the goal that is established by the EPA as far as approved AFV's.

"Update of B-20 Research …..NCSU":

Mr. Harbinson stated that NCDOT is conducting a research project with NC State University (NCSU) to find out exactly how much particulate matter is being produced from a dump-truck loaded with material under different operating conditions. He emphasized that it is one thing to conduct these tests under test conditions (controlled environment) and a different matter to put a driver behind the wheel of one of these vehicles. This is due to different driving habits of individual drivers. They are trying to determine the emissions from regular diesel engines versus AFV's. Presently, four single axle and five tandem axle dump trucks are being tested. In addition, eight to nine more types of equipment will be tested. The results of these tests are expected in a final test report by the end of this year. Mr. Bruce Thompson added that Tier 1 engines are the non-EGR engines while the Tier 2 engines are the EGR engines or the new generation engines.

Another research project (with NCSU) that has been submitted for approval involves looking at the soybean plant (source of fuel) itself. These tests will determine if qualities that increase NOx levels can be bio-engineered out of the fuel source. This would have a significant impact on biodiesel use. In addition, positive results in this testing could decrease our dependency on foreign oil while making drastic positive impact on our environment.

Simultaneously, a lot of attempts by the private sector are being conducted to come up with fuel additives that would decrease the NOx emissions. So far, these have not been very effective other than one C-tane product that hold some merit, as determined by the Southwestern Research Center. Mr. Harbinson stated that these initiatives are driven by the Clean Air Act (CAA) and the Energy Act.

Ms. Szlosberg asked if there is any initiative in the area of installing efficiency indication meters in the dashboards of these AFV vehicles? Mr. Harbinson stated that there was not.

"NCDOT Recognition":

Mr. Harbinson stated that NCDOT has started receiving national recognition in numerous areas relating to environmental stewardship. In addition, Mr. Thompson and Mr. Harbinson have attended numerous conferences and have engaged as guest speakers at these conferences to share the initiatives that are being undertaken at NCDOT in the alternative fuels arena. Each year, NCDOT is invited to participate in the Fuel Odyssey Day by the Clean Cities Coalition. Mr. Thompson has been scheduled as a Guest Speaker at the University of Idaho to discuss the NCDOT efforts to meet the requirements set forth in the CAA and has participated in the biofuels conference at NCSU.

“Bypass Filter Savings”:

Mr. Harbinson discussed the results of the change in oil change frequency from every 20,000 miles to 40,000. This change in frequency was implemented about six weeks ago and the results are very promising.

The change in frequency has been accomplished by the use of the by-pass filtration technology. This involves the double-clean methodology to allow greater frequency between oil changes. The net result is a tremendous cost savings impact as well as less oil consumption, thus the positive impact on the environment.

The longer frequency between oil changes has its associated risks – a higher risk on engine damage. However, this risk has been minimized by an oil sampling test that augments the increased frequency between oil changes. This test allows closer monitoring of engine wear.

There are approximately 4,067 units that have the by-pass filtration system installed. The following is a summary of the totals relating to these units on a single oil change cycle:

Units in Fleet	Qts. Oil per Unit	Total qts. For all class codes	Total cost of oil ($)	Cost of standard filter ($)	Cost of by-pass filter ($)	Cost of Labor ($)	Total Cost per oil change ($)
4,067	356	152,506.00	144,880.70	28,469.00	2,765.56	142,711.03	318,826.29

The figures above are based on the following:

Average Cost of Oil:	$0.95 per Quart (6 month average)
Cost of standard oil filter:	$7.00
Cost of Bypass Filter:	$0.68
Cost of Labor Per Hour:	$35.09 (based on 1 hour per oil change per unit)

The conclusion the Fleet Unit reached is that by increasing the frequency from 20,000 miles per oil change to 40,000 miles, a net savings of $318,826.29 is realized for the 4,067 units.

Mr. Harbinson mentioned that there is one Superintendent who is currently performing tests to determine if the frequency of oil changes can be extended to every 65,000 miles. They are awaiting the data to be collected from these tests before a final decision can be made to change oil at this frequency.

Ms. Szlosberg also asked what the big picture targets are for the Fleet Unit in meeting the Clean Air and the Energy Acts. and do we have any specific goals established? Mr. Harbinson responded with the following:

1. In non-attainment Metropolitan Statistical Areas (MSA's), 75 % of any new vehicles that are placed in service must be AFV's. This applies to 8500 GVW and lower. Mr. Harbinson stated that on the gasoline side, they are placing the E-85 and the Hybrids to meet the CAA.
2. NCDOT's diesel fleet hasn't been mandated to meet new standards at this time. Only the gasoline powered vehicles are affected.
3. New York DOT is using Compressed Natural Gas for their fleet. However, this would be very costly for our 129 or so fuel sites at the cost of approximately $200 – 300,000 per site.
4. We are getting emissions credits. For every 2,250 gallons of alternative fuel used, NCDOT gets 1 credit for AFV's up to 50%. We cannot exceed all the credits we generate.

Ms. Szlosberg followed up the asking what percent of our fleet is using alternative fuels? Mr. Harbinson responded by stating that 2,500 are using biodiesel fuel and most of these are in Divisions 5, 10, and 12. This constitutes approximately 8-10% of our total fleet and much higher percentage for the rolling fleet. In addition, Mr. Harbinson stated that Divisions 6, 7, 9, and 10 also have approximately 200 vehicles that are fueled with propane.

Ms. Szlosberg asked if there is any advantage of using synthetic fuel as far as Air Quality is concerned. Mr. Harbinson stated that when an engine is running efficiently, there is very little Air Quality affect since you would not burn any significant amount of oil. In addition, he stated that the Fleet Unit has looked into using synthetic oils and they have performed some studies in conjunction with the University of West Virginia. At this time it not cost effective for the Fleet Unit to use synthetic oils due to the much higher costs (40 – 50% higher than natural oil). In addition, NCDOT is partnering with EPA in testing large pieces of equipment since the EPA has a dynamometer that is capable of testing large equipment. NCDOT is providing the vehicles to EPA for testing in return for the research data. It is targeted to be in place next year.

In response to an inquiry from Ms. Szlosberg about whether NCDOT has specific goals established in this area, Mr. Harbinson responded with the following:

1. Yes, they have developed these goals about three years ago. The extensive use of biodiesel is part of meeting these goals as are all the other initiatives discussed in the previous slides.
2. It is very difficult to set targets now due to the rapidly changing technology. We do not want to commit one form over another since new technology is constantly bringing newer and better fuels and engine design.
3. Looking and experimenting with different types of fuels and vehicles (including electric vehicles or EV's) and that way they will be prepared to make more informed decisions.

This concluded Mr. Harbinson's presentation and he opened the floor to questions. The following questions and answers were presented during the meeting:

Mr. Mac Campbell asked whether we are using straight or muti-grade weight of oil. Mr. Harbinson responded that we are using multi-grade weight since that would conform to the manufacturer's recommendations and this is important to stay within the warranty parameters. Mr. Harbinson also stated that initially there were concerns with using biodiesel with Tier II engines but NCDOT has not had any problems in this area and the concerns have proven to e unfounded.

Regarding the statement made that biodiesel vehicles produce 20 % less particulate matter and result in 1-3% increase in NOx levels, Karim Manji asked if this is based on in-house performance measurements or national data. Mr. Harbinson stated that it is based national research data.

A Board Member asked whether the Clean Air Act applies to the private sector or if is it just applicable to the public sector. Mr. Harbinson and Mr. David Hyder responded that at this time it applies only to the public sector (government). However, he stated that the bypass filtration technique is being used by the private sector, especially the larger fleet carriers. According to Mr. Harbinson, the private sector will be eventually included in the Clean Air Act mandates.

Ms. Szlosberg thanked Mr. Harbinson for his presentation. She also introduced the following items as future topics of discussion, as well as topics that follow-up with the Committee:

- Hog Waste. She asked where we stood with the letting of the contracts on this issue. Mr. Don Lee responded by stating that we were very close.
- Cool Communities (and Model Projects)
- High Quality Resources (this item may be presented at the Safety and Emerging Issues Committee)
- Noise Wall Policy -- (to be the subject of discussion for a meeting scheduled for later that day)
- Environmental Management Systems Performance Measures. She stated this effort was underway and that Ms. Julie Hunkins is spearheading the effort. She also stated that more is to come on this subject.

She then introduced Karim Manji, a new employee with the Office of Environmental Quality, who will be assisting the Department with its Environmental Management Systems effort. She thanked everyone for attending the meeting and adjourned the meeting at 9:35 AM.

The next meeting of the Environmental Planning and Policy Committee is scheduled for Wednesday, October 6, 2004 at 8:30 AM in the Board Room (Room 150) of the Transportation Building.

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